

accuracy through lever action. Using his braced fingers as the fulcrum, the point of his instrument can be very accurately controlled by concentrating on the movement of the end of the long lever arm, his elbow or shoulder. Similarly the artist uses his mallet stick. With these principles, the surgeon in using such as scissors or hemostat may brace, with an extended finger, with his forearm, with his other hand, and etc.

The basic thing in the art of movements of skill is relaxation. The whole body is put in relaxation, and the only part that moves is that part required to execute the movement. In addition to relaxation the whole body is also put in poise. This is balance. Motion with the hands loses its refinement if the back is off balance, with the consequent strain on the back muscles subconsciously diverting our attention or effort. With the body in relaxation and poise, our attention to it is then relieved, and 100 per cent of our attention or effort can be concentrated on the movement of the hand. If now we brace down on some of the fingers our whole amount of effort and attention is concentrated to just that part which is distal to the last brace. In this way we can use the maximum amount of refinement in the motion, and the tremor can be avoided.

If a Wolfe graft is not handled atraumatically, that part of it which has been abused, turns black with necrosis towards the end of the first week. If the delicate membrane (epitenon) about a tendon becomes scratched, an adhesion between the tendon and its sheath forms at this point, preventing function. If nerve suture is not done atraumatically, fibrous tissue will form between the two ends and around the junction tightly encircling it and preventing regeneration. If trauma is used where grafts are placed, serum forms about the grafts. This becomes infected and the grafts slough out. If infection does not occur, the tissue reaction replaces much of the graft with scar tissue and binds it tightly. Many more disasters due to trauma can be cited, but suffice it to again state that unless we use an atraumatic technique, the higher surgery of reconstruction cannot be accomplished. If mastered, it will greatly facilitate the simpler forms of surgery and give not only an easier convalescence, but very little local reaction. The reduction in the amount of local reaction is surprising.

Atraumatic technique not only does much of what is claimed in anoci association, but has the advantage of insuring an approximation to reactionless healing and in reducing infection. We refer to the art of surgery, so why not make it an art, and, like the artist, be engrossed in its handicraft?

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### ACUTE BRAIN INJURIES

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Injuries of the head do not decrease perceptibly in spite of the "safety first" propaganda. There has also been an alarmingly high death rate until the past few years, but improved diagnostic methods, better judgment as to what cases are operable, and still better technique have reduced the

mortality from 53 per cent to 15 per cent or 28 per cent, depending on clinics.

The *acute abdomen* is probably considered the field of medicine where most skill, the application of more auxiliary methods in diagnosis, the most needed place for the use of surgical judgment, and often the occasion where real courage in certain forms of treatment is demanded. I feel that the *acute head injury* is a close competitor to the *acute abdomen*, if it does not surpass it, in its need of all the essentials mentioned for the former, to make life-saving and the future normality of the patient.

The reason for the high mortality and poor functional results have been, that many cases were operated unnecessarily, others have been operated at the wrong time, and there have been failures to operate still others that could have been saved by surgery.

Therefore, the three factors that are responsible for the great reduction of mortality and the giving of more nearly normal patients following these injuries, are as follows:

1. Determination of whether the patient should be operated or treated expectantly.
2. If there is surgical intervention—the selection of the proper time.
3. The type and technique of the procedure.

We know that a large group of these injuries recover under proper medical observation and treatment. Also a smaller group will die whether operated on or not. A third moderately large group will be saved by operating on them at the proper time and manner, or lost by letting that opportunity pass, or else having a recovery with a patient who has headaches, mental and emotional disturbances or psycho-neurosis.

Therefore, it is seen that it is in this latter group where preventing deaths and securing future normality is to be obtained.

These cases are the ones that demand the most skill and closest observation by the doctor as well as an intelligent nurse to determine the condition or stage of the patient. I will enumerate the symptoms and signs of "Acute Brain Injury," emphasizing and dwelling on those of proven value. Those to watch—and it is best to instruct the nurse as to their meaning and value—are:

1. General symptoms: Headache, nausea and vomiting.
2. Local signs: Ecchymosis, bleeding from eyes, nose, throat and ears.
3. Local signs: Shock, temperature, pulse rate, and quality, respiration, blood pressure, paralysis, impaired sensations, unconsciousness, restlessness, convulsions, reflexes, pupillary changes and urinalysis.

Special study of the following will be dwelt on, viz.: First, X-ray findings of the bony injury of the skull. No doubt much unnecessary surgery and vice versa, the failure to operate is due to the X-ray report. Many cases are frantically rushed to the operating-room for trephine because of a report of vault fracture, without regard to the question of shock or whether the important member, the brain itself, is being damaged. The skull is not the object here, but the

result of the fracture on the brain as regards direct trauma or its effect on intracranial pressure. The X-ray of the skull is of value, but is secondary to the structure it houses.

The second of the special studies of signs is a competent ophthalmoscopic report of the fundus. Beginning papiladema, if studied carefully and frequently, is a very accurate estimation of the beginning and increasing intracranial pressure and should never be omitted in studying these cases.

The third, and probably most important of all findings, is the spinal puncture which may be of value in discovering blood in the cerebro-spinal fluid; and the pathologist may make other tests, such as cell counts, etc., that are of determining value. The one most crucial test is the estimation of the increased intracranial pressure. This may be estimated by the rapidity with which the fluid spurts out, but is best and most accurately measured by the spinal mercurial manometer. (Instrument exhibited.) It has been found that an adult patient, reclining, has a normal pressure of from 5 to 9 m.m. of mercury, and pressure above that means increase of the intracranial pressure, especially if it shows 12 m.m., or more.

While considering spinal puncture, it is well to add that there is a real danger of compression of the medulla in the foramen, although it is only in a very small per cent and usually in those with very high pressure, and particularly in the cases with subtentorial pressure. There have been a number of necropsies showing a "collar" of the medulla from this source. This should always be thought of, and if there is a high pressure the tube may be compressed and the fluid allowed to flow out very gradually, and in that way the danger is avoided.

The neurologist should always be an important member of frequent consultations in these cases, especially the ones in the questionable class.

The increase in our knowledge in the past few years of what goes on in the brain has much improved our results in treatment, and a few words as to the increase of intracranial pressure is permissible. We know that many cases of head injury without bone fracture are as serious as if a fracture existed, as when due to concussion or a hemorrhage which may occur either epi- or subdurally and cause serious conditions. There may be no demonstrable damage to any structure, and yet a wet brain with its increase of pressure may cause death by medullary compression and edema. Or, we may have prolonged increased pressure that so damages the brain tissue that connective tissue is developed and the patient is the typical post-traumatic psycho-neurotic, with the headaches and emotional and mental symptoms that are so frightful. Many of these may be saved, and death prevented by proper treatment at the proper time. We must also keep in mind the fact that some of the supposedly slight concussions may develop any or all of the above conditions, just as some apparently very serious cases may clear up rapidly and permanently.

#### TREATMENT

First remember that about 60 per cent of serious head injuries have shock, also that about 10

per cent of them will die in shock, so that proper early treatment of the patient may do much in lowering mortality.

*Quiet* and *heat* are our best remedies—which means that if the patient can be put easily in a warm place and not molested, he is better off than if he is madly rushed to the hospital without consideration of his bodily temperature, shaking up and, etc. Stimulants, camphor in oil, etc., may be used, and morphine is often excellent as in any kind of shock and is not contra-indicated as was once thought. Hot coffee per rectum is also good, but do not over-stimulate as the patient comes out of shock for fear of increasing an intracranial hemorrhage.

Later we may use catharsis and an ice cap with absolute quiet. Some think that atropine in large doses prevents pulmonary edema, and sedatives for restlessness are, of course, desirable.

Aseptic care of any wounds is imperative, though sterile gauze over the ears is often less mischievous than efforts at cleansing the canal when cerebro-spinal fluid has shown that an injury there connects with the cranial cavity.

Lumbar puncture has a place in reducing pressure of the brain, and may be repeated a reasonable number of times.

A trephine to elevate or remove a depressed vault fracture may be demanded, but should often be secondary to a subtemporal decompression, especially if the fracture is over an important area of the brain and if there is, or is likely to be, increased intracranial tension. Rapid herniation of brain substances may mean disaster, and later herniation with the horrible fungus growth is a calamity the surgeon wants to avoid.

Subtemporal decompression is the greatest boon to this class of cases, and has become in the past few years so perfected and standardized that it is safe and of inestimable worth. Some of its advantages I will quote from "Sharpe's Brain Injuries."

1. "It exposes as widely as necessary, a comparatively 'silent' area of the brain, the temporo-sphenoidal lobe and, therefore, any operative damage to the exposed cortex will not appear clinically; also, in patients having a high intracranial pressure the danger of a hernial protrusion of a highly-developed area of the brain with resulting paralysis, etc., cannot occur.

2. "Being situated midway between the frontal and occipital lobes, it permits the careful exploration of all parts of the ipsilateral hemisphere and ventricular puncture, as well as permanent drainage, is also possible.

3. "It exposes the area of the middle meningeal artery, so frequently injured in the traumatic cases, and also affords excellent drainage to the middle cranial fossa at its lowest point—a very important factor in the treatment of brain injuries.

4. "A firm closure of the decompression opening is obtained by means of the strong temporal muscle and its overlying fascia with its strong attachment to the parietal crest intact—a most important requisite in patients having a high intracranial pressure. Hernial protrusions with their frightful fungi are most rare.

5. "Technically, the operation is less difficult than other cranial operations in that the skull opening is made through the thinnest area of the vault—the squamous portion of the temporal bone.

6. "The vertical incision is preferable to the former curved one in that it renders more possible a careful hemostasis of the scalp by means of the method of bi-manual pressure-traction and the clamping of the main branch of the temporal artery at the very beginning of the operation, whereas the curved incision passes through the various branches of the vessel in the scalp, and they must be clamped individually. Again, the vertical incision not only permits drainage at the lowest point of the skull, but it makes possible a large subtemporal bony opening without risk of loosening the attachment of the temporal muscle and fascia to the parietal crest, insuring a firm closure with no danger of cerebral hernia.

7. "The great frequency of temporo-sphenoidal lesions such as tumors, abscesses, and brain injuries make this routine exposure of the subtemporal decompression a most important aid in the treatment of underlying intracranial lesions."

#### SOME PRACTICAL POINTS IN RESUME

In the past, and even now, in many places, a suspected head injury is treated only from the standpoint of skull fracture. If an injury to the bony vault is demonstrable, surgery is at once resorted to, whereas if no fracture is found, or if there is a basal fracture, the case is often hopelessly abandoned.

In these injuries about 60 per cent are in shock, and about 10 per cent will die while in shock.

Study of the eye grounds and spinal puncture, with determination of the increased intracranial pressure, are the two crucial tests in determining the condition of patient.

Kocher, many years ago, made observations and recognized four stages from treatment standpoints.

First stage of compression—Medical expectant treatment.

Second stage of compression—Ideal operative stage.

Third stage of compression—Imperative operative stage of medullary compression.

Fourth stage of compression—Non-operative or hopeless stage of medullary edema.

It is imperative not to operate in shock or in the late stage of medullary edema.

Vault fractures often are best done secondary to a subtemporal decompression.

Increased intracranial pressure is the principal criterion as to the necessity for surgery.

Subtemporal decompression should be more frequently done.

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#### THE NEUROLOGICAL ASPECTS OF VISCEROPTOSIS.\*

By THOMAS G. INMAN, M. D., San Francisco.

Visceroptosis, not infrequently discovered accidentally in the course of the routine examination, may be present in a marked degree without, apparently, causing a single subjective symptom. Attention is attracted to the alimentary canal be-

cause of the presence of other local conditions such as constipation, indigestion, meteorism or mucous colitis and it has been customary to associate with the visceral ptosis certain distant symptoms, referable especially to the nervous system. Of these, weakness, nervousness, vertigo, syncope and insomnia are said to be the most frequent. It is extremely doubtful, however, if any one of these symptoms may truthfully be said to be due to the ptosis alone. Undoubtedly the whole question has been somewhat clouded by a lack of appreciation of the fact that the individual of the so-called enteroptotic habitus and the otherwise normal individual with more or less visceral ptosis belong in two widely separated groups. In the former or congenital type there is especially noted the long, narrow thorax; the small, central heart, small lungs; pouching of the lower abdomen and faulty station. The respiratory excursion is shallow and costal in type and sudden calls for exertion are attended by an abnormal increase in the pulse rate. Yet, these individuals, in the absence of the interpolation of local or general disease, may go through life without suffering in the least from any symptom referable to their physical defect other than a somewhat limited supply of reserve energy. They early learn to adapt themselves to their capabilities and thus escape that extreme exhaustion which is often the starting point of the train of symptoms which makes these cases familiar to us all.

Individuals in the other group, in which visceral ptosis is to a greater or less extent acquired, always present concomitant disease. These are the cases with relaxation of the abdominal walls, lacerated perineal, lowered position of the hollow viscera as a result of adhesions following inflammatory conditions of the lower abdomen and diminution of visceral and somatic muscle tone following local or general diseases of a toxic nature. It is in this type that recognition of the true clinical picture is attended with difficulty and the real condition is often overlooked because the attention is directed to the accompanying pathology. Too, these patients, habituated to other conditions of health, cannot accept their disability as the natural consequence of an inherent physical trait and there arise abnormal mental attitudes which add to the difficulties of diagnosis and treatment.

Some twelve years ago my attention was drawn to this subject following the description in the literature of a number of operations for the relief of ptosis and excessive mobility of one or another of the abdominal organs. Experience showed that the mere elevation and fixation of a viscus seldom relieved the patient of the symptoms which led to the performance of the operation. Some investigations were undertaken at that time in collaboration with the late Dr. Fayette Watt Birch to determine if other factors were not essential to the syndrome credited to visceroptosis. The results were collected and published in 1912 under the title, "Blood Pressure Observations on Patients with Relaxed Abdominal Musculature."<sup>1</sup> The conclusions arrived at were briefly as follows:

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<sup>1</sup> The Journal of the American Medical Association, January 27, 1912; vol. 58, pages 265-268.